Automatic Generation of Performance/Memory Models for Parallel Scientific Applications

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The Challenge

- How can we make performance **instrumentation**, **collection**, and **analysis** a more automated/efficient process??

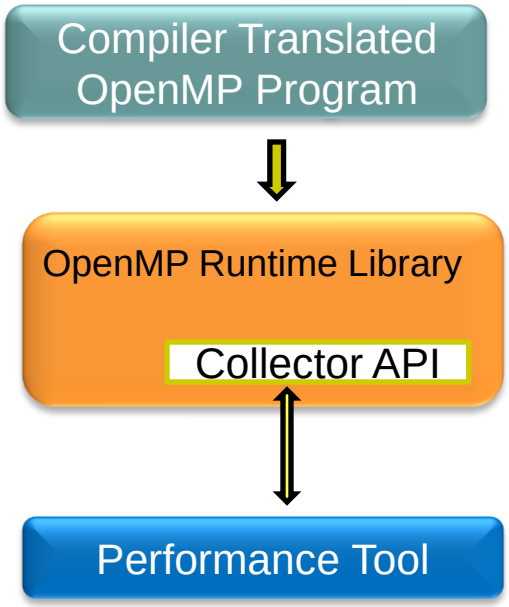
- A “standard” performance profiling interface does not exist for several parallel programming models

Why a Standard Profiling Interface?

- Reduce the cost of tool development
- Performance measurement and analysis more efficient across platforms
- These APIs should be designed to facilitate instrumentation, collection, and analysis

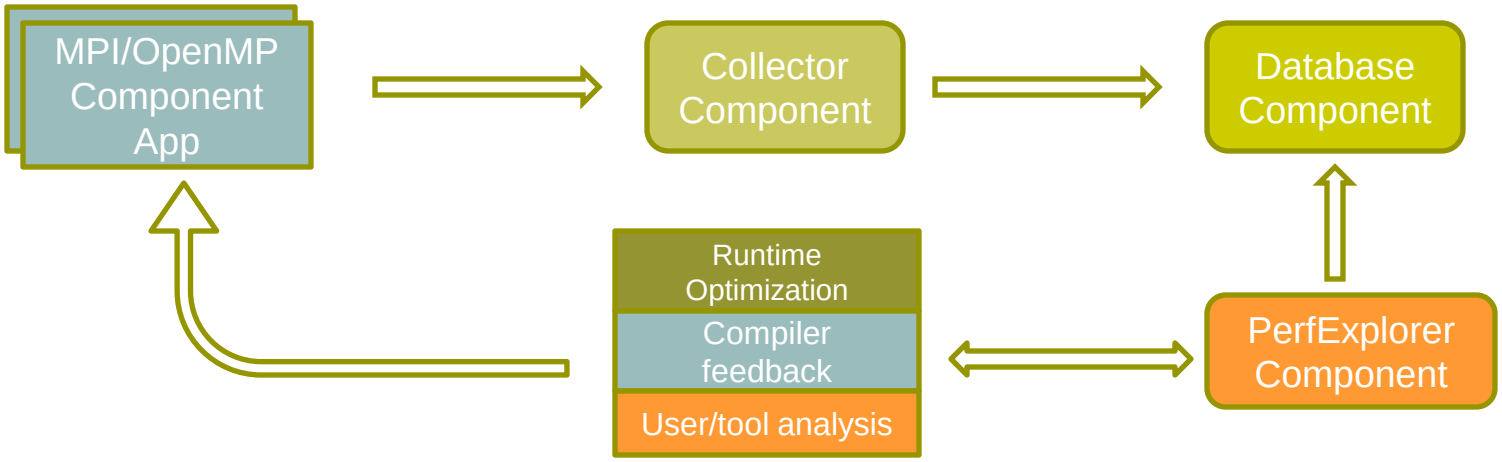
OpenMP Runtime API for Profiling

- OpenMP ARB “sanctioned” performance monitoring interface for OpenMP
- Implemented inside the OpenMP runtime library
- Performance tools communicate with OpenMP runtime library through this interface



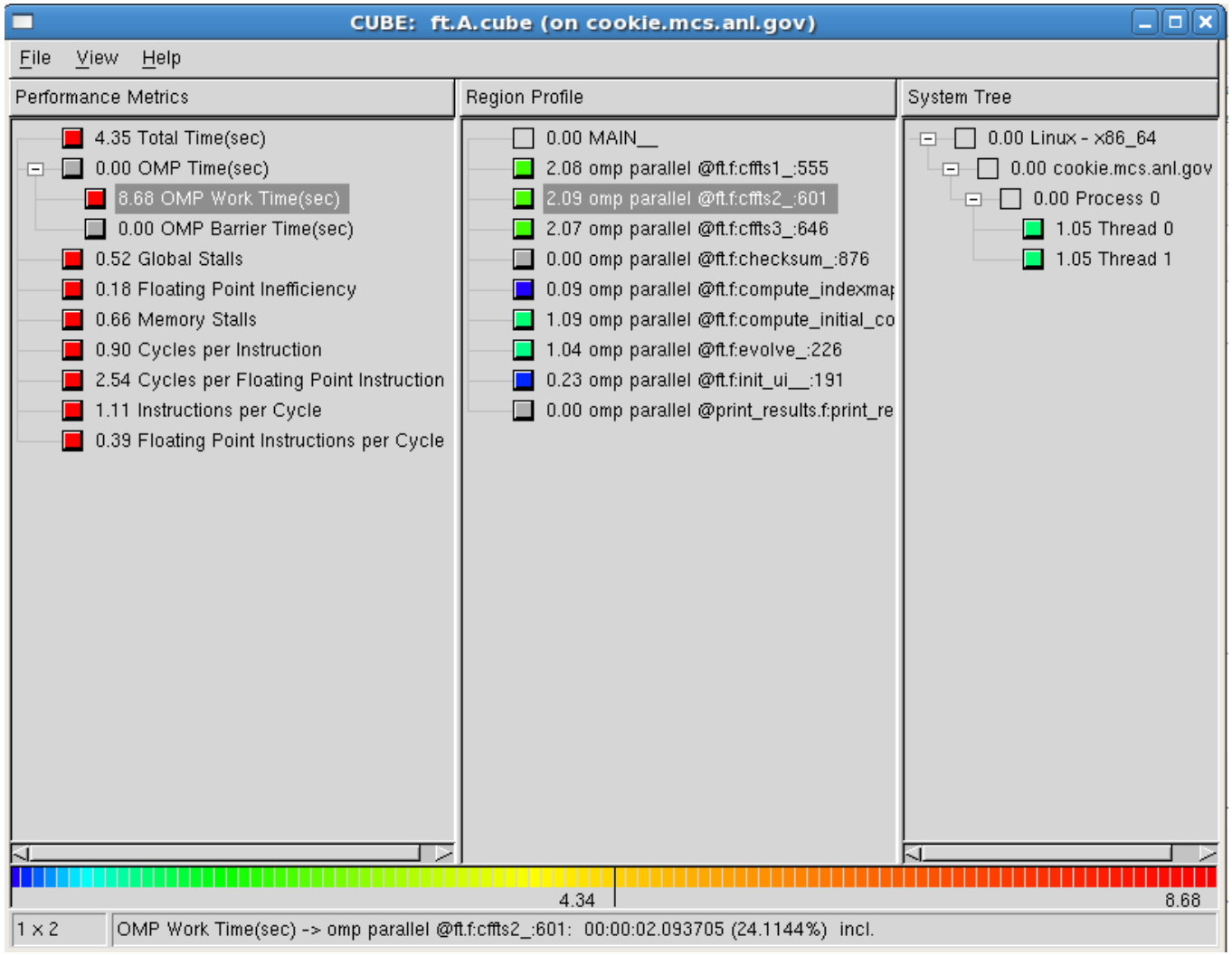
Performance Measurement and Analysis System

- Components
  - Performance Collector (measurement + analysis)
  - Database Component
  - PerfExplorer (performance and power analysis)
  - Application components



System Components

Performance Visualization



Conclusions